© Academy of Management Journal
2006, Vol. 49, No. 4, 759–777.

FILLING EMPTY SEATS: HOW STATUS AND ORGANIZATIONAL HIERARCHIES AFFECT EXPLORATION VERSUS EXPLOITATION IN TEAM DESIGN

FABRIZIO PERRETTI
GIACOMO NEGRO
Bocconi University

Informal and formal mechanisms affect choices between exploitation and exploration in team design. We argue that the status differentiation of team members and differences in organizational structure limit exploration in the form of introducing newcomers to teams and creating new combinations of team members. High- and low-status team members and one- and three-layer organizational structures were expected to be positively related to exploration, and middle-status team members and two-layer structures were expected to be negatively related to it. We used data on 6,446 motion pictures produced by the Hollywood film industry in the period 1929–58 to test our hypotheses.

Fifteen years ago, March (1991) developed a theory about how organizational knowledge and learning influence the balance in organizations between strategies of exploration and exploitation. One organizational feature suggested as affecting this balance is the difference between experienced and inexperienced personnel. March argued that "old-timers," who are more familiar with the knowledge already reflected in their organization, tend to produce exploitation, and newcomers, who are more likely to contribute new knowledge, increase exploration. The increasing reliance on teams in organizations (Ancona & Caldwell, 1992) raises the question as to whether this type of heterogeneity also affects the exploration versus exploitation trade-off at the team level and hence informs how teams should best be composed.

Deciding whom to put on a project or a team is one of the biggest challenges facing a manager or team leader (Reagans, Zuckerman, & McEvily, 2004), and mixing and matching newcomers with old-timers to form new configurations are important decisions in designing teams (Chen, 2005). Such decisions are particularly relevant in temporary settings (e.g., research groups, airline crews, medical teams), where members are regularly cycled and recycled, moving frequently into new teams within or between organizations (Arthur, 1994; Hackman, 2002). The distinction between newcomers and old-timers has been recognized by the extant literature on teams as an important dimension of heterogeneity (Jackson, Stone, & Alvarez, 1993). However, most of this literature studies the effects of team heterogeneity on various outcomes, assuming team composition as exogenous (Guzzo & Dickson, 1996; Williams & O'Reilly, 1998). We suggest, instead, that team composition is itself the outcome of two processes, a team-level and an organization-level process, in which team members and the organizational structures responsible for team outcomes can influence or control member selection.

This study not only investigates the effects of these two processes on team composition but also extends March's perspective by suggesting that the exploration-exploitation balance can provide a lens through which team composition can be analyzed. We focus on two dimensions of team composition: (1) newness of members, and (2) newness of member combinations. In each dimension, the greater the extent of newness, the greater the implied extent of exploration. The established Weberian definition of status and power (Lenski, 1966; Weber, 1953) as distinct

The article has greatly benefited from the comments and suggestions of special research forum editor Anil K. Gupta and two anonymous reviewers. We thank Greta Hsu, Ozgecan Köçak, Daniel Levinthal, Tammy Madsen, Ram Mudambi, Jackson Nickerson, Susan Olzak, Olav Sorenson, and Giovanni Valentini for comments on previous versions of the paper and discussions that improved the original manuscript substantially. All errors and omissions remain our own. We also gratefully acknowledge financial support from the Claudio Dematté Research Division of SDA Bocconi and a grant from the Swiss National Fund for Scientific Research (#109940). We wish to dedicate this article to the memory of Claudio Dematté, who strongly supported our effort but could not enjoy its reward.

sources of social stratification—whereby hierarchies of positions result in unequal access to goods and services and thereby affect one person's control over another's behavior—is a basis for our analysis. We consider how rankings based on (1) an informal process of status differentiation between team members and (2) a formal process dependent on different organizational structures influence the employment of newcomers and the use of new combinations of team members. Our study suggests that both processes affect the trade-off between exploration and exploitation. Particularly, the processes show a U-shaped relationship with exploration, inhibiting and then fostering newness in team composition.

We tested our hypotheses in the context of the Hollywood film industry from 1929 to 1958, which seemed a particularly appropriate setting for our study. No one person in the entire motion picture field knows for certain what's going to work. Movies are thus a high-risk group endeavor in which high-status members usually represent a hedge against disaster and ensure against empty seats at film theatres. Hollywood has always been a "caste-system where big stars didn't pal around with unknowns, but if even studio giants couldn't guess the biggest star in their business, the territory is thus a bit murkier than expected" (Goldman, 1984: 13). As a result, films are temporary team-based projects in which managers constantly mix and match artistic and technical members in the hope of increasing the chances of producing hits (Caves, 2000).

What makes the film industry particularly intriguing is that markets and careers intersect, and a dual matching process between film projects and their participants takes place (Faulkner & Anderson, 1987). Careers are produced by projects (and their controllers) distinguishing among candidates by applying tests of reliability, performance, and accountability. At the same time, candidates distinguish among projects and evaluate their potential of fulfilling their demands and career aspirations. In addition, in the time frame analyzed here, the U.S. film industry employed different systems of production and management, seeking an optimal balance between the industry's need to deliver relatively standard products and the creative imperative of producing novel products (Caves, 2000). This study investigates how these two elements—the matching process and the organizational design process—affect team composition.

THEORY

Designing Teams: The Influence of Members' Diversity

A team can be regarded as an open and complex system made up of a set of members who perform specific functions and interact through a coordination network with one another, as well as with the larger social context in which the team is embedded (McGrath, Arrow, & Berdahl, 2000). Our focus is on task-related teams, which are groups whose task requires team members to work together to produce something for which they are collectively accountable and whose acceptability is potentially assessable (Hackman, 2002).

Team design relates to the specification of team size, membership, and staffing; the definition of a team's tasks and members' roles; and the creation of organizational support for the team (Guzzo & Dickson, 1996). As part of team design, team composition (who is on a team) is a frequently studied variable and refers to configurations of attributes, either of team members or subgroups within a team. Team composition usually involves (1) a selection process, in which an organization invites potential members to be part of a new or existing team and (2) a reciprocal evaluation process, in which potential candidates screen existing members and other potential candidates to decide whether to join the team (Ilgen, Hollenbeck, Johnson, & Jundt, 2005). In both cases, the expectation of performance levels plays a major role. Potential members of task-focused groups base performance expectations on the multiplicative production relationship, also known as the "O-ring theory of production" (Kremer, 1993), according to which every member of a team must perform at or above some threshold level of proficiency. Team members are aware that below-threshold performance by a single member can dramatically endanger whole-team performance, and thus candidates and existing members develop performance-level expectations for each other, and for themselves.

Previous studies have shown how performance expectations are based on existing or potential team members' observable set of attributes and characteristics (Ridgeway & Berger, 1986; Webster & Hysom, 1998). Such attributes can include gender, ethnicity, age, education, culture, style, experience, and functional expertise (Jackson et al., 1993; Williams & O'Reilly, 1998). The attribute we investigate is newness of team members, and we focus on "newness to industry" rather than "newness to firm" or "newness to team." As we explain in detail in the methods section, this dimension captures the elemental exploration versus exploitation trade-off.

We discriminate as a first approximation between newcomers and old-timers. Researchers have not only argued that the two categories are distinct, but also that inexperienced and experienced members have different interpretations of organizational reality and use different "sense-making" processes (Jones, 1986). Empirical evidence shows that the distinction between newcomer and old-timer matters at both the team and the organization level and is relevant for organizational socialization, group interactions, and group effectiveness (Moreland & Levine, 1989; Morrison, 2002).

Newcomers are important because they may set the stage for innovation. The additional elements of ingenuity and improvisation they can bring can yield fresh perspective for a team and a novel interpretation of the problems the team faces, thus generating creative solutions. However, organizations have little or no prior knowledge about how newcomers will perform and interact with other members (Chen, 2005). In entering unfamiliar organizational settings, newcomers may experience a reality shock or a sense of surprise that has been likened to the experience of entering a new and foreign culture (Jones, 1986; Louis, 1980). Like those entering a foreign culture, newcomers incur a "liability of foreignness" and thus incur the risks of high information search costs, stereotyping, and marginalization by old-timers (Jackson et al., 1993).

By comparison, old-timers' performance and compatibility with other members have already been tested in other teams. Old-timers are more socialized because they have had more time to observe, accept, and adopt predominant norms and values. However, they also represent the major source of inertial behavior, rigidity, and resistance to new solutions (Rollag, 2004). According to March (1991) old-timers know more, but what they know is redundant as their knowledge is already reflected in the "organizational code," (i.e., the rules and forms of an organization) and they are less likely to contribute new knowledge. On the other hand, although newcomers are less knowledgeable than the individuals they replace, what they know is less redundant with the organizational code, and they are more likely to deviate from it. Newcomers stay deviant long enough for the code to learn from them.

Teams are not mere collections of people but configurations of social actors joined to one another by basic ties (McGrath et al., 2000). This social perspective shifts the focus of team composition from choosing from a given set of members to choosing from a set of interdependent combinations. In creating a new team, organizations not only select between newcomers and old-timers but also choose: (1) to keep using old-timers, replicating combinations already used in prior teams, (2) to keep using old-timers, but in new combinations with other old-timers, or (3) to introduce newcomers in the configuration and thus create new combinations among newcomers and/or between newcomers and old-timers.

Accordingly, team composition concerns not only mixing but also matching newcomers and old-timers. Mixing involves balancing the advantages of recombining old-timers used in previous teams—thus exploiting the knowledge and wisdom gained from prior team experience—with the advantages of introducing newcomers without prior experience who can be later reused in other team configurations, thus allowing the exploration (and future exploitation) of more creative solutions. Matching involves having old-timers be part of old combinations or form new combinations, either with other old-timers or with newcomers. Old combinations, which are already familiar and routinized, can speed up task execution, but old-timers who have lost interest in remaining together or experienced interpersonal tensions may resist them (Ilgen et al., 2005). New combinations offer novel prospects and a sense of excitement and opportunity but require mutual trusting. Team members must feel that their team is competent enough to accomplish the task and will not harm their individual interests. Untested combinations can more easily lead to communication difficulties, discrimination, and conflict (Jackson & Joshi, 2004).

Team configurations are options exercised from a set of possible choices: if something goes wrong, it may prove difficult to use the same configuration in other projects. Team composition is thus the outcome of a search process that takes place within a constrained set of solutions and is both cause and consequence of the balance between exploration and exploitation, and between heterogeneity and homogeneity.

Team-Level Constraints: The Influence of Members' Status

Social status is an important dimension of member heterogeneity. Status is defined as position within a social structure that confers rights, prestige, or honor upon an individual according to various ascribed and achieved criteria (Parsons, 1970). Status not only relates to the position of an individual but can also be an attribute of a group that, within its larger social environment, has successfully claimed a specific honor and thus enjoys certain privileges (Parsons, 1953).

Status-organizing processes are based on any

characteristic of social actors around which evaluations of or beliefs about them come to be organized (Berger, Rosenholtz, & Zelditch, 1980). Our study focused on the measurement of status as social prestige (Wegener, 1992). Prestige is the esteem, respect, or approval granted by an individual or a collective for performance or qualities they consider above the average. Formal prizes and awards issued through competitive public procedures create status, which can be measured by the number or range of such accolades an individual or a group receives (Goode, 1978). This allocation of prestige depends to a large extent on significance of the audiences (i.e., customers, peers, and critics) who assign such formal prizes.

The allocation of prestige produces a hierarchy based on a particular type of performance or quality, and such rankings affect one social actor's ability to control another's behavior. From the social exchange perspective, prestige is a commodity that can be exchanged but is subject to asymmetrical exchange processes in which benefits received cannot be reciprocated (Blau, 1964). For instance, social actors with low status benefit from associating with high-status actors more than they benefit from affiliation with other low-status actors and will seek to enter esteemed groups and share in their prestige (Goode, 1978). On the other hand, high-status actors aim at preserving their position, and thus tend to avoid their lower-status counterparts, generally restricting their range of possible partners to those with whom they have had prior interactions (Podolny, 1994).

In contexts characterized by uncertainty and risk, distinct evaluations by external audiences sustain status hierarchies (Podolny, 1993) and lead to the emergence of status-based "homophily" (McPherson, Smith-Lovin, & Cook, 2001), which influences the range of possible interactions among team members. According to this perspective, status-based homophily will hinder successful collaboration in teams that contain both high- and low-status members, especially if the teams include newcomers. However, sociological research on status also points out that social conformity is highest in the middle of a status hierarchy and lower at the top and the bottom. Phillips and Zuckerman (2001) reestablished the middle-status conformity theory with empirical evidence. According to this view, members with high or low status are much more at liberty to depart from accepted norms than those in the middle without violating audiences' role expectations. They are more willing to deviate from experienced sets of behavior, to accept higher search risks, and to engage in random exploration of more distant portions of the creative space. These arguments suggest that organizations composing teams can combine high-status team members with low-status members such as newcomers with few constraints and that middle-status members will be the most difficult to successfully mix and match with others. Hence:

Hypothesis 1. In teams, member status will have a U-shaped relationship with the extent to which team design is characterized by exploratory features such as (a) newness of team members and (b) newness of combinations of team members.

Organization-Level Constraints: The Influence of Hierarchy

Teams do not exist in isolation from the overall structure of the organization in which they are set (McGrath, 1991). On the contrary, teams interact systematically with the organizations in which they are nested in many ways, including negotiating delivery deadlines, coordinating or synchronizing work flow with other lateral functional groups, mapping resources, and obtaining support from upper levels of management (Ancona, 1990). Because of such interaction, the general design of an organization can affect the design of a team. Among the features of organizational design, hierarchy is one of the most pervasive, consisting of structures in which individuals are arranged in a cascade of authority and communication relations (March, 1994).

According to Thompson (1967), organizations tend to localize tasks and confine them to the smallest possible inclusive units, such as crews or teams. Control of such teams is typically organized via one of three general hierarchical structures. In a simple "one-layer structure," top management has full responsibility and direct control over projects and resources located in different crews or teams. But as the numbers or sizes of project groups increase, top managers can no longer be realistically involved in the progress of all the initiatives being pursued. To increase efficiency, organizations tend to develop a "two-layer structure": the higher layer is responsible for deciding which projects the firm implements; the lower layer, positioned at the team level, is assigned project control and is responsible for implementing the projects.

However, there may be strong interdependencies between an organization's different projects. Although a two-layer structure may be efficient for actually controlling projects, it may be less able to coordinate interdependent elements. This limitation may lead organizations to "develop liaison

positions linking the several groups and the rule-making agency" (Thompson 1967: 61) by introducing a middle hierarchical layer, "which is not simply higher than the one below, but . . . is a more inclusive clustering, or combination of interdependent groups, to handle those aspects of coordination which are beyond the scope of any of its components" (Thompson, 1967: 59). The organization and management of project groups is now via a "three-layer structure."

We focus our analysis of team design on three scenarios: (1) one-layer structures, in which the CEO of a firm (who is both top manager and also the project manager for all teams) is responsible for designing the different teams; (2) two-layer structures, in which the CEO oversees the various projects and the project managers control the design of their teams; and (3) three-layer structures, in which a layer of middle managers exists between the CEO and the project managers and team design is the joint responsibility of project managers and these liaison middle managers.

All projects involve risk that their managers will seek to avoid (March & Shapira, 1987). One-layer structures, in which a central manager is able to spread his or her risk over different projects, support exploratory behavior. However, as projects' number, size, or complexity increases, it becomes more difficult for one individual to manage them efficiently. As a result, a two-layer structure may develop in which responsibility for the various projects is assigned to different managers. By being focused on single projects, managers are able to foster efficiency but cannot take advantage (or avoid the problems) of cross-project interdependencies or spread their risk over a portfolio of projects. For instance, project managers may be unable to access resources until other projects are completed or face the risk of being subject to budget or schedule deviations beyond their control (Wilemon & Cicero, 1970). To contain these higher project risks, project managers rely on acquired experience and past sets of behavior and, rather than coping with the added risk of using newcomers or new combinations, which involve testing and integration costs and can induce performance or schedule deviations, project managers will prefer employing combinations of experienced team members. Thus, two-layer structures move the balance in favor of exploitation at the expense of exploration.

With the introduction of middle liaison managers, who are able to account for interdependencies in their risk perspectives, a three-layer structure can readjust the balance toward exploration. A series of studies (see Ancona, 1990; Floyd & Woolridge, 1997; Tushman, 1977) has documented how middle managers mediate between an organization's institutional (strategic) and technical (operational) levels. Burgelman (2002) described the innovatory role of middle managers in the strategic change that transformed Intel from a memory company to one emphasizing microprocessors. The introduction of a middle hierarchical layer enhances coordination between interdependent projects and fosters exploratory behavior, increasing the chances of employing newcomers and new combinations at the team level. Therefore, we suggest that exploration in team design will be highest in one and three-layer structures and lowest in two-layer structures; hence:

Hypothesis 2. Hierarchical layers in organizational structures will have a U-shaped relationship with the extent to which team design is characterized by exploratory features such as (a) newness of team members and (b) newness of combinations of team members.

METHODS

Background for Empirical Setting

The relevance of status. Decades ago, Rosten characterized Hollywood as a community of filmmakers "engaged in an endless search for deference, from the world, their colleagues, themselves" and busy in a long "effort to win respect from symbolic juries" (1941: 44). Audience evaluations in turn affect the perceptions and behavior of relevant social actors: rankings suggest what films moviegoers should see, and producers use personnel rankings when deciding how to develop their projects, judging that some inputs (primarily actors and directors) enjoy higher visibility and thus represent assets that will increase the projects' likelihood of success or that can be used as vehicles for product differentiation. Thus, choices of team composition are biased toward highly valued directors, well-established and bankable actresses and actors, and successful technical personnel (Faulkner & Anderson, 1987). As a result, rankings influence the careers of artistic and technical personnel, as individuals associated with successful films build reputations that help them gain subsequent film contracts.

Film actors and directors can achieve high-status ranks when the judgments of multiple audiences converge. These people are the stars, the "demigods and demi-goddesses in the forefront of public attention" (Rosten, 1941: 9). As there is a shared recognition that such positions are available to only a few people, high-status actors gain not only pres-

tige and admiration (Goode, 1978) but also a confidence in their social acceptance that allows them to deviate from conventional behavior. Producers can deploy high-status personnel to promote novel solutions while incurring only small risk. The outcome is similar for low-status personnel. Since there is no consolidated judgment from audiences, they may enjoy a higher degree of freedom in their choices. On the contrary, personnel occupying intermediate-status positions might see themselves at risk of falling in audience rankings and are more unlikely to deviate from established expectations.

The impact of organizational structures. Hollywood's production practices have historically been driven by a constant tension: "a movement toward standardizing the product for efficient economical mass production and a simultaneous movement toward differentiating the product as the firms bid competitively for a consumer's disposable income" (Bordwell, Staiger, & Thompson, 1985: 88). To try to meet these simultaneous but conflicting demands, studios have adopted different modes of production and hierarchical systems of management control.

In the late 1920s, Hollywood operated under the so-called central producer system, a one-layer organizational structure whereby studio heads were responsible for coordinating the entire annual production of each firm, which might amount to 30 to 50 films a year. In the early 1930s many production executives were of the opinion that such factory methods could no longer be applied successfully to the creative aspects of film production (Lewis, 1933). Studios then introduced alternative organizational structures that aimed at retaining the advantages of large-scale operations yet encouraged individual effort in the creative phases of picture production.

One solution was the "producer-unit" system, a two-layer organizational structure in which individual (unit) producers took on responsibility for the complete production process for an individual film. According to this system, "each producer would be allowed to proceed with his assignment unmolested by company supervision. The producer would select a cast in accordance with his own ideas. He likewise could choose a director and all other personnel needed to produce his particular film" (Lewis, 1933: 100).

A second solution was a three-layer organizational structure that involved a unit producer together with a middle-level manager, often an experienced ex-department head, as associate producer (Bordwell et al., 1985). The associate producer was "a new studio official to be placed in authority over writers, players, directors and others employed in each film-making unit, his duty being the coordination of all departments with the two-fold intention of insuring high quality and eliminating waste" (Hampton, 1931: 316). The alternative organizational designs did not completely replace the central producer system. Rather, studios now had different options, and they employed whichever management structures they found most advantageous (Bordwell et al., 1985).

Sample and Data Collection

For our study, we collected and analyzed data on all 6,918 feature films produced from 1929 to 1958 by the seven largest U.S. motion picture industry producers (the "majors": Columbia Pictures, MGM, Paramount, RKO, 20th Century Fox, Universal, and Warner Brothers). Our sample focused on fictional feature films, the main type of motion picture produced and released by the majors, and excludes animation, documentaries, newsreels, and short films, because their production and distribution required different sets of resources and capabilities, creative as well as technical (Jones, 2001). We also eliminated silent movies, which by 1930 were a minor and rapidly declining product type in the industry (Balio, 1993). In order to analyze team composition without focusing on any underlying architectural variation, we started our observation period in 1929, when the majors had completed their transition to sound (Crafton, 1999). We ended our analysis in 1958, the year RKO terminated production before disbanding, and following the completion of the reorganization induced by the 1948 antitrust intervention (the last theater divestitures took place in 1956–57) and competition from television led to a drastic decline in the number of feature films produced and released by the majors.

[1] The following history is exemplary. In 1957, after starring in *The Man Who Knew Too Much*—one of Paramount's biggest hits, directed by top-level director Alfred Hitchcock and costarring top performer Doris Day—James Stewart (an Oscar winner in 1941, a four-time Oscar nominee, winner of the New York Film Critics award in 1939, and top box office star in both 1954 and 1956), accepted the leading role in *Night Passage*, an offbeat western movie. The film was directed by James Neilson, a TV-series director in his first movie experience, and costarred Audie Murphy, who had never been awarded a prize and had never appeared in a hit film. But the choice didn't damage Stewart's career: he went on to star in *Vertigo* (1958) and then played the leading role in *Anatomy of a Murder* (1959), for which he received an Oscar nomination and won the New York Film Critics Award.

Our primary data source was the *American Film Institute Catalog of Motion Pictures (AFI),* a decade-by-decade encyclopedic publication that provides product-level information on all motion pictures released in the United States between 1893 and 1970 using a single compiling methodology (Jones, 2001; Mezias & Mezias, 2000). Where this catalog's records were incomplete (from 1951 onwards), we relied on Fetrow's (1999) and Nash and Ross's (1985) filmographies. All information was then checked with the federal *Motion Picture Catalog of the Library of Congress 1950–1959,* a government publication that records films receiving copyright protection along with production entities and copyright dates. Because there were occasional gaps in information from these sources, our final sample comprised the 6,446 features for which we had complete details.

Measures

Dependent variables. We analyzed teams' exploratory features by defining two variables that directly describe (1) the presence of newcomers and (2) new combinations of team members. We operationalized the two variables by creating a *newcomers index* and a *new combinations index,* ordinal representations of an unmeasured continuous variable (McKelvey & Zavoina, 1975; Winship & Mare, 1984). Both indexes were based on the five most important creative and technical personnel categories in film production: the director, the two leading actors in their screen credit order, the editor, and the director of photography (cinematographer). Within a film's artistic team, the lead actors and the director are the most visible resources in the basic package presented to top management for "green-lighting" and to investors who may provide financing. They are crucial for differentiation and signaling purposes. Within the technical team for a film, we selected the two functions that make the most general contributions to the structural design and quality of realization of the product (Bordwell et al., 1985).

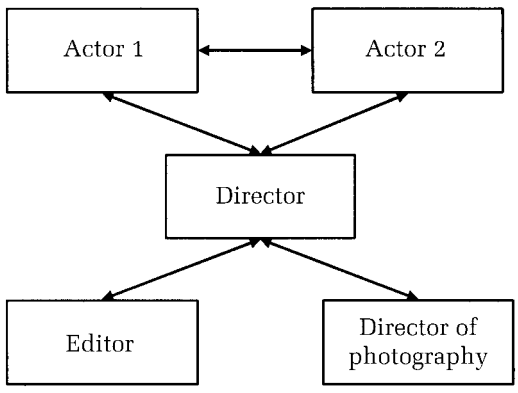
The first index, *newcomers,* was a count of the number of newcomers included in a film and ranged from 0 to 5. Higher values of the index implied higher exploration. To avoid inflation in the first years of observation, we considered individuals as new if they had not been employed in the industry before 1926. A newcomer was thus defined as an individual who was new to the industry and not as new to a firm, to team work, or to other members of the organization because we intended to capture the risk-taking and search dimensions of explorative action. March argued that exploration depends on gaining new information to improve future returns rather than on using currently available information to improve present returns (1991: 72). If we had focused on newness to a firm, for example, we would have treated as exploration choices made using existing information about personnel who had worked for competitors; such choices would, however, indicate exploitation more than exploration.

The second index, *new combinations,* scored dyadic combinations according to the level of newness each one involved. Of the dyads resulting from our selection of five key creative categories, we chose director–actor 1, director–actor 2, actor 1–actor 2, director-editor, and director-cinematographer for computing our second index. Figure 1 illustrates these combinations. For each film in the sample, we calculated the number of dyads involving new and previously employed personnel. We then

[2] Some inputs, like screenwriters, were excluded from the analysis by design. Scripts can be developed before assembly of a team begins, and usually screenwriters do not intervene in the selection of key team members like actors or directors. Moreover, writers often employ non-original materials for their scripts. The original authors may be credited as writers, but in fact they have no role in the project; for example, films based on Shakespeare's plays may credit Shakespeare as writer. In these cases, data would become unreliable or be missing.

[3] For example, *Public Enemy* (produced in 1931 by Warner Bros.) starred two new lead actors, James Cagney and Jean Harlow, together with three people with previous experience: the director William A. Wellman, the editor Edward M. McDermott, and the cinematographer Dev Jennings. The newcomers index value for the film was therefore 2.

FIGURE 1
Dyads Included in the Measurement of the New Combinations Index



attributed the resulting scores to the film. As with the previous index, we considered a combination to be new if it had never been employed in the industry before 1926.

The new combinations index was calculated as a composite of three submeasures: (1) c1, which was the proportion of dyads containing at least one new resource, (2) c2, which was the proportion of dyads presenting new combinations of old resources, and (3) c3, which was the proportion of dyads that were old combinations of old resources. After applying a weight of +1 to c1, 0 to c2, and −1 to c3, we computed an average value that ranged from −1 to +1 with 0.2 intervals. The rationale for the weighting scheme was that under resource scarcity, a trade-off between exploration (c1) and exploitation (c3) occurs. Moreover, combining existing knowledge to generate new combinations (c2) constitutes neither pure exploration nor pure exploitation (Katila & Ahuja, 2002). Higher values of this index indicate higher exploration.

We focused our analysis on dyads because they represent the essential unit of social interaction, the basis for more complex forms (Simmel, 1902), and provide the ideal locus for studying homophily (McPherson et al., 2001). Film production involves two distinct, core subteams—the artistic and the technical—with the director working across them as the sole coordinating figure (Goldman, 1984; Kawin, 1987). The set of dyads considered here was chosen to provide a meaningful representation of the film production process and also to limit the likelihood of observing links as an artifact of random association patterns when there was no direct interaction between actors and editors or cinematographers.

Silver's ethnographic work (1975) analyzed how the director of a movie functions as the mediator in the teams' interaction patterns. Silver observed that technicians did not even talk to the actors during shooting: "They spoke to the assistant director who then spoke to the director who then spoke to the actors" (1975: 87). And a principal actor explained: "Everything revolved around him. As it should. Every function on a film—whether actor, editor, cameraman, or writer—should work through the director" (Silver, 1975: 77).

[4] In the case of *Public Enemy,* the score for the index was 0.4, calculated as follows: director–actor 1 = +0.2 (Cagney was a newcomer), director–actor 2 = +0.2 (Harlow was also a newcomer), actor 1–actor 2 = +0.2, director-cinematographer = 0 (Wellman had never worked with Jennings before) and director-editor = −0.2 (Wellman had worked with McDermott on *Maybe It's Love* in 1930).

Independent variables. A composite index of variables measured the status conferred by three external audiences on individuals. The individual variables used for the composite index *status* were (1) director status, (2) lead actor 1 status, and (3) lead actor 2 status. To account for prestige conferred by one or multiple audiences—peers, the market, and critics—we coded the variables on a 1–4 scale as follows: 1, "no recognition of high status by any of the three audiences"; 2, "recognition by one of the three"; 3, "recognition by two of the three"; and 4, "recognition by all three." We then multiplied the three measures to create a single composite measure of status in which higher values meant higher status. The multiplicative function underlined the growing disparity in opportunities and rewards that emerges from status differentiation (Merton, 1973). We used the quadratic term of the index (*status squared*) to test for a curvilinear relationship between status and newness.

The first dimension used to calculate the status index was peer recognition through formal prizes, which act both as awards for individual performance and as public announcements that convey information about status. Because of their news value, prizes have considerable effects on actors' choices and careers (Goode, 1978) and become a source of actor differentiation that perpetuates stratification in social structures. The most influential award in the film industry is the Academy of Motion Picture Arts and Sciences Award—the Oscar—and its major effects are increases in prestige, salary, and the power to negotiate the roles and employment of costars. These effects are long-lasting; in fact, they tend to be permanent (Levy, 1987). For peer recognition, we assigned scores based on personnel having won Oscars, using data from Shale (1993).

The second status dimension was market recognition. In the film industry, box office results are the most visible indicator of success. Players featured in box office hits achieve the label "stars," and, in this uncertain industry, producers believe that hiring them will systematically improve their chances of differentiating their products and achieving or repeating success. The result is that stars gain access to more and better job opportunities, command higher salaries, and exercise power by influencing the production process (Caves, 2000). To measure market recognition, we collected data from rankings of actors and directors based on box-office results published by the leading trade publication *Motion Picture Herald* since 1932. For years before 1932, we integrated the list of players starring in the five top-grossing films with data

from the same source. Rankings of stardom are volatile and are regularly updated, and lists and information lose value rapidly. For each film, we gave scores according to whether personnel had been included in the money-making rankings in the prior year.

The third status dimension was critics' recognition. Like other cultural industries, film production is characterized by quality uncertainty and oversupply, two conditions that offer critics a gatekeeping role (Caves, 2000). Critics accumulate specialized training, expertise, and knowledge in particular domains, and their cultural capital legitimizes their judgments. Thus, positive selection by critics produces visibility and confers prestige. For critics' recognition, we attributed scores to winners of the New York Film Critics Circle (NYFCC) Award, deemed the most influential in the industry (Levy, 1987). For years prior to the founding of the award in 1935, we employed data from the prominent *Film Daily* Critics Poll.

Hierarchical layers. Our measure of organizational constraint was based on observation of the production roles attached to films. To represent the three hierarchical solutions that might be adopted to coordinate production of a film—the central producer, or *one-layer,* organizational structure; the unit producer, or *two-layer,* structure; and the unit producer with associate, or *three-layer,* structure—we created two dichotomous variables. The first variable took the value 1 if a film was coordinated by a unit producer, and 0 otherwise. The second variable took the value 1 if the film was coordinated by a unit producer plus an associate and 0 otherwise. The central producer structure was the reference category.

Control variables. Environmental munificence (the availability of environmental resources) might have affected the exploratory behavior of Hollywood studios (Miller & Shamsie, 1996). To control for this effect, we included a measure of the aggregate annual industry turnover in deflated dollars in the year prior to the release of a film. The variable measuring environmental munificence was named *box office gross*.

The institutional regime prevalent in a period might also affect studio behavior. In 1948 a series of antitrust decrees issued by the U. S. Supreme Court imposed separation of exhibition interests from production and distribution activities on the vertically integrated major film studios. After 1948 the majors reduced their long-term contractual arrangements with creative talent and relied more on film-by-film deals. We introduced a dichotomous variable, *post-Paramount case,* coded 1 for films produced after 1948, and 0 otherwise, to capture institutional regime.

Size might also shape studio behavior. Larger organizations tend to be more bureaucratic and less flexible in their decisions (Hannan & Freeman, 1984). Although increasing size generally implies excess resources that can be used for innovation, resources can become overabundant and damage performance by diminishing project selection discipline (Nohria & Gulati, 1996). We measured size as *firm revenues,* the total volume of ticket sales generated by the films released by each firm in the year prior to the release of a focal film. Data came from Finler (1988) and company reports.

Large pools of resources might guarantee broad use and reduce the need to employ new resources. We measured each studio's resources, or *talent pool,* as the studio's total number of contracts with creative and technical personnel (the minimum contractual duration considered was two years). The data came from two annual directories, the *Motion Picture Almanac* and the *Film Daily Year Book,* and from Finler (1988). This measure correlated with firm size at .51 but allowed a more precise control for resource utilization because we determined its effect holding size and strategy constant.

Because accruing experience promotes formalized relationships and standardized routines, firms with greater experience might show inertia and keep close to their established competences when they innovate (Sørensen & Stuart, 2000). Inertia might have reduced the introduction of newcomers in the film projects analyzed. The effect on recombinations depended on the "stickiness" of background knowledge vis-à-vis the assimilation of new information. Our control variable for *firm experience* was the cumulative count of films made by each firm up until the year prior to the release of a focal film.

We also controlled for the influence of top managers' history of product experimentation. Executives can experiment early in their appointments in order to learn how to be effective. Later, they become more confident but feel less pressured to increase their learning (Miller & Shamsie, 2001). However, as experience grows, executives tend to become less prone to error and more likely to be rewarded for their experiments (March, 1991). We

[5] We did not rely on accounting data because during our observation period the film studios engaged in diversified activities and did not separate out the assets or financial performance of their motion picture businesses or, specifically, its production sector.

TABLE 1
Descriptive Statistics[a]

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12
1. Newcomers index	0.44	0.71												
2. New combinations index	−0.13	0.46	.55											
3. Status	1.37	1.24	−.09	−.10										
4. Two hierarchical layers	0.75	0.43	−.06	−.03	.02									
5. Three hierarchical layers	0.12	0.32	−.03	−.02	.02	−.54								
6. Box office gross	8.90	2.20	−.04	−.05	.01	.12	.13							
7. Post-Paramount case	0.22	0.41	.05	.06	.08	.19	−.05	.06						
8. Firm revenues	7.44	4.06	−.05	−.02	.12	−.07	.10	.12	−.07					
9. Talent pool	65.57	25.01	−.11	−.07	.08	.05	.04	.21	−.14	.51				
10. Firm experience	9.84	4.74	−.03	.00	.11	.15	.06	.30	.37	.23	.29			
11. Studio head tenure	7.08	6.68	.03	−.02	.01	.14	−.02	.23	.24	−.17	−.18	.14		
12. Producer experience	0.07	0.26	.09	.10	.01	.05	.04	.06	.08	.00	−.02	.04	.05	
13. Film budget	0.06	0.24	−.04	−.02	.02	−.01	.05	.18	.11	.09	.09	.06	.05	.01

[a] n = 6,446. Coefficients of .06 and above are significant at $p < .05$.

included first- and second-order terms measuring of years of *studio head tenure* to control for time dependence in product experimentation. Data were from Finler (1988).

Producer experience was another a control variable. When individuals or organizations lack experience, their abilities to execute routines and solve problems are limited (Hannan & Freeman, 1984; March, 1991). Also, inexperienced producers are less likely to obtain access to resources or engage in relations with established counterparts because of their weak positions in the social structure (Stinchcombe, 1965). We introduced a dummy variable to signal when a film was the first to be coordinated by a producer at any hierarchical level.

Our final control variable captured the effect of financial resources, because films with higher financial resources might use expensive, high-status inputs, thereby reducing the introduction of new resources (Caves, 2000). We used a dummy variable to indicate whether a film was produced using more costly technologies (color, wide screen, etc.) as a proxy for high budget.

Analysis

Our dependent variables had outcomes ranked on scales ranging from 0 to 5 and from −1 to 1, respectively. We analyzed them as ordinal because their outcomes could be ranked in categories but the distance between them was not known, conditions violating the assumptions needed for use of linear regression models (McKelvey & Zavoina, 1975; Winship & Mare, 1984). Therefore, we employed polytomous logistic regression—ordered logit analysis—to examine our data (Long, 1997). To allow nonindependence within and across clusters of observations, we combined robust estimators of variance with additional correction for the effects of clustered data grouped on the seven firms.

RESULTS

Table 1 reports the means, standard deviations, and correlations among the variables used in the study. Regression results are presented in Tables 2 and 3. To test coefficients with clustered estimation, Wald tests can be used in place of likelihood-ratio tests, and adjusted tests are useful when the total number of clusters is smaller than 100, as it is in this case of a total of 7 (Korn & Graubard, 1990). We present the results from adjusted Wald tests to compare competing specifications jointly with Akaike's information criterion (AIC), which can be employed when likelihood-ratio tests cannot compare nonnested models (Long, 1997). Models with smaller AIC values are considered better-fitting specifications.

Results of Regression Analyses

Models 1a and 1b in Tables 2 and 3, respectively, show how the control variables affect the logarithmic odds of the introduction of newcomers and the

[6] A Brant test examining the parallel regression assumption revealed that none of the explanatory variables showed statistical significance at $p < .10$ or higher, suggesting that the assumption had not been violated (Long, 1997).

TABLE 2
Results of Ordered-Logit Regression Analyses for the Newcomers Index[a]

Variable	Model 1a	Model 2a	Model 3a	Model 4a	Model 5a
Status		−0.34*** (0.07)	−0.41*** (0.08)		−0.41*** (0.08)
Status squared			0.01** (0.00)		0.01** (0.00)
Hierarchical layer 2				−0.48*** (0.08)	−0.47*** (0.08)
Hierarchical layer 3				0.18** (0.06)	0.17** (0.06)
Box office gross	−0.01 (0.04)	−0.01 (0.04)	−0.01 (0.04)	0.01 (0.04)	0.01 (0.04)
Post-Paramount case	0.02 (0.17)	0.08 (0.16)	0.09 (0.16)	0.07 (0.16)	0.13 (0.15)
Firm revenues	0.03 (0.02)	0.04* (0.02)	0.04* (0.02)	0.03 (0.02)	0.04† (0.02)
Firm experience	−0.01 (0.01)	−0.01 (0.01)	−0.01 (0.10)	0.01 (0.01)	0.01 (0.01)
Talent pool	−0.01** (0.00)	−0.01* (0.00)	−0.01* (0.00)	−0.01* (0.00)	−0.01* (0.00)
Executive tenure	−0.06† (0.03)	−0.05† (0.03)	−0.06† (0.03)	−0.06* (0.03)	−0.05* (0.03)
Executive tenure squared	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01** (0.00)	0.01** (0.00)
Producer experience	0.48*** (0.08)	0.49*** (0.08)	0.49*** (0.08)	0.53*** (0.08)	0.55*** (0.08)
Budget	−0.19*** (0.06)	−0.20*** (0.06)	−0.20*** (0.06)	−0.22*** (0.05)	−0.22*** (0.05)
Threshold parameter estimates					
θ_1	0.01 (0.37)	−0.36 (0.33)	−0.43 (0.32)	−0.18 (0.34)	−0.61 (0.30)
θ_2	1.79 (0.36)	1.43 (0.32)	1.37 (0.31)	1.61 (0.34)	1.20 (0.30)
θ_3	3.32 (0.38)	2.98 (0.34)	2.91 (0.33)	3.15 (0.37)	2.74 (0.31)
θ_4	4.83 (0.52)	4.48 (0.47)	4.42 (0.46)	4.66 (0.50)	4.25 (0.45)
θ_5	6.74 (0.69)	6.40 (0.69)	6.33 (0.69)	6.57 (0.68)	6.16 (0.68)
Log pseudo-likelihood	−5,587.77	−5,540.07	−5,538.83	−5,569.08	−5,520.46
Wald test (prob. > χ^2)		25.09 (1)***	26.92 (2)***	37.75 (2)***	101.22 (4)***
AIC	1.738	1.724	1.723	1.733	1.718

[a] n = 6,446. Robust standard errors corrected for the effects of clustered data are in parentheses.
† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

TABLE 3
Results of Ordered-Logit Regression Analyses for the New Combinations Index[a]

Variables	Model 1b	Model 2b	Model 3b	Model 4b	Model 5b
Status		−0.15*** (0.04)	−0.30*** (0.06)		−0.30*** (0.05)
Status squared			0.01*** (0.00)		0.01*** (0.00)
Two hierarchical layers				−0.41*** (0.10)	−0.39*** (0.10)
Three hierarchical layers				0.16** (0.06)	0.14* (0.06)
Box office gross	−0.02 (0.03)	−0.02 (0.03)	−0.02 (0.03)	0.00 (0.03)	−0.01 (0.03)
Post-Paramount case	0.20 (0.14)	0.23† (0.13)	0.25† (0.14)	0.23† (0.14)	0.24* (0.13)
Firm revenues	0.03† (0.02)	0.03* (0.02)	0.03* (0.02)	0.02 (0.02)	0.03† (0.02)
Firm experience	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Talent pool	−0.01* (0.00)	−0.01* (0.00)	−0.01* (0.00)	−0.01† (0.00)	−0.01† (0.00)
Executive tenure	−0.06** (0.02)	−0.05** (0.02)	−0.05** (0.02)	−0.06** (0.02)	−0.06*** (0.02)
Executive tenure squared	0.01* (0.00)	0.01* (0.00)	0.01** (0.00)	0.01** (0.00)	0.01*** (0.00)
Producer experience	0.64*** (0.01)	0.64*** (0.10)	0.64*** (0.10)	0.68*** (0.09)	0.69*** (0.09)
Budget	−0.10 (0.11)	−0.10 (0.11)	−0.11 (0.11)	−0.11 (0.11)	−0.12 (0.11)
Threshold parameter estimates					
θ_1	−3.71 (0.34)	−3.89 (0.33)	−4.05 (0.34)	−3.89 (0.33)	−4.22 (0.33)
θ_2	−2.85 (0.30)	−3.03 (0.29)	−3.18 (0.29)	−3.03 (0.29)	−3.35 (0.28)
θ_3	−1.91 (0.30)	−2.08 (0.28)	−2.24 (0.28)	−2.08 (0.28)	−2.40 (0.27)
θ_4	−1.10 (0.31)	−1.27 (0.28)	−1.42 (0.28)	−1.27 (0.29)	−1.58 (0.27)
θ_5	−0.26 (0.30)	−0.41 (0.28)	−0.56 (0.27)	−0.42 (0.29)	−0.72 (0.27)
θ_6	0.63 (0.31)	0.48 (0.28)	0.33 (0.28)	0.46 (0.30)	0.17 (0.28)
θ_7	1.12 (0.31)	0.97 (0.28)	0.82 (0.28)	0.96 (0.29)	0.67 (0.27)
θ_8	1.74 (0.30)	1.59 (0.27)	1.44 (0.27)	1.58 (0.29)	1.29 (0.26)
θ_9	2.09 (0.30)	1.94 (0.27)	1.79 (0.27)	1.93 (0.29)	1.64 (0.26)
θ_{10}	2.99 (0.33)	2.84 (0.29)	2.70 (0.29)	2.83 (0.32)	2.54 (0.29)
Log pseudo-likelihood	−13,925.77	−13,891.66	−13,875.81	−13,907.73	−13,858.41
Wald test (prob. > χ^2)		12.56 (1)***	30.00 (2)***	17.25 (2)***	204.73 (4)***
AIC	4.327	4.316	4.312	4.322	4.307

[a] n = 6,446. Robust standard errors corrected for the effects of clustered data are in parentheses.
† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

recombination of team members. We found a curvilinear effect of studio head tenure, indicating higher exploration in later years. In keeping with this result, producers on their first films tended to exploit previously employed personnel. A larger resource base reduced the need to introduce new personnel into the production teams. In model 1a, higher budgets traded new resources for more expensive established ones. Other variables controlling for inertia in organizational action showed only limited or nonsignificant effects. We did not find that the Paramount decrees affected design in production teams in a significant way.

In the next step, with models 2a and 2b we estimated a linear effect for personnel status, and with models 3a and 3b we added the quadratic term. In general, the higher the composite status, the less likely it was that newcomers would enter production teams or that old-timers would be mixed in new combinations. As actors and directors gained status, they seemed less willing to jettison the benefits associated with their positions. However, high-status personnel, for whom recognition from multiple audiences increased their role security, enjoyed greater freedom and seemed to foster exploration. Results from the Wald tests and the AIC revealed fit better relative to the baseline. We found strong support for our first hypothesis.

Models 4a and 4b tested our second hypothesis by including the two producer dummies. Tables 2 and 3 show signs and statistical significance consistent with our prediction: Although coordination by a unit producer decreased the likelihood of entry for newcomers and limited new combinations, the presence of associates had a positive effect. The unit producer system might have had high efficiency, but we found evidence that it did not foster exploration. The Wald tests and the information criterion indicated improving fit of the models, supporting the second hypothesis.

Models 5a and 5b, our full models, included the status and hierarchical layers variables. The direc-

tion of the coefficients and the statistical significance replicated the findings obtained in the intermediate specification. The Wald test and the AIC also indicated that the full models offer the best-fitting specifications. Our hypotheses were strongly supported.

For a finer-grained interpretation of our results, we used odds ratios, particularly percent changes in the odds for unit or standard deviation increases in the dependent variables. Percent changes are calculated by subtracting the odds ratio from 1 and multiplying the difference by 100. For instance, in model 5a the odds of observing higher exploration values for new team members were .38 times smaller when a unit producer supervised a film and .12 times larger when an associate was involved in the project, and all other variables were constant. The odds of having values that are less positive for exploration via use of new team members were .40 times smaller with a one-standard-deviation increase in the composite status index. The odds became .26 times larger for the quadratic term of the status index. Finally, we examined the predicted probabilities of observing individual values in our dependent variables within the observed range. For instance, for regular-budget films made in 1929–48 involving a unit producer who had previous experience in filmmaking, the probability of observing the entry of three newcomers into a team is 0.16 when the status index is 3, 0.02 when the index is 12, and 0.05 when the index reaches its maximum of 27.

So far we have focused on the aggregate effects of status on team composition. The structure of our index allowed us to explore whether particular types of personnel had more impact than others on team composition. Models 6a and 6b, reported in Table 3, separately tested the effects of director status and actor status. The U-shaped relationships for status continue to hold at the individual level. However, we found interesting differences in the impact of status on exploration. High-status actors generated stronger, negative effects on exploration than directors. In model 6a a one-unit increase in actor status decreased the change in odds by 78.3 percent, while a similar increase in director status decreased the odds by 55 percent. Actors enjoy greater visibility with audiences than directors, and this advantageous position appeared to allow them to exert more power in team composition.

[7] As our models were not linear, the magnitude of change in the outcome probability for a given change in one of the independent variable depended on the levels of all of the independent variables.

[8] Individual probabilities were calculated from the full model by first evaluating covariate effects, then subtracting these effects from the appropriate threshold, and finally transforming the results into individual probabilities.

Robustness Checks

We tested the findings' robustness in three ways. First, we considered alternative models of estimation, including (1) the generalized ordered logit model, in which the regression coefficients could vary across the different equations; (2) the continuation ratio, in which the categories for the ordinal outcomes were an interdependent progression of events; (3) negative binomial regressions, in which the new combinations index was rescaled to positive integers from 0 to 10; and (4) cross-sectional time series regressions, with firm, year, or film genre used as the grouping unit. Second, we modified the time windows for the status effects, applying a one-year or an indefinite duration to all three measures. Neither exercise affected the results.

Third, we addressed some of the methodological issues confronting our analysis arising from the specific construction of our variables, particularly the dyads and status. Table 5 presents a reestimation of the full models under three cases. First, we examined the effects of triads. Our main analysis measured dyads as powerful representations of interaction and interdependence, and the simplest form of social interaction embedding the basic features of more articulate interaction. However, other forms, such as triads, incorporate additional functions absent in dyads, such as intermediation, which can introduce asymmetry (Krackhardt, 1999). Model 7 presents the results from a regression analysis with triadic combinations as the dependent variable, with ranges varying between −2 and 2. Even accounting for potential asymmetry in team interaction, our main results continue to hold. Second, in our principal analysis, the composite index of status took a multiplicative form to reflect the interdependence of the film production process and the comparative advantage accruing to high-status personnel. But such advantage may increase additively rather than multiplicatively. Thus, in models 8 and 9 we estimated the full models with the status index calculated as the sum of individual status within the team. Our main findings remained unaffected. Third, as shown in the final model presented in Table 5, we combined the previous two checks to estimate model 10, and the results were again unaffected.

TABLE 4
Results of Ordered-Logit Regression Analyses for the Newcomers and New Combinations Index, Individual Effects[a]

Variable	Model 6a		Model 6b	
Director status	−0.80**	(0.27)	−1.55**	(0.58)
Director status squared	0.15**	(0.06)	0.37**	(0.13)
Actor 1 status	−1.53**	(0.54)	−0.96***	(0.26)
Actor 1 status squared	0.29*	(0.13)	0.18**	(0.06)
Actor 2 status	−1.63*	(0.68)	−2.31*	(0.92)
Actor 2 status squared	0.27	(0.22)	0.50*	(0.21)
Two hierarchical layers	−0.48***	(0.08)	−0.41***	(0.10)
Three hierarchical layers	0.17**	(0.06)	0.15*	(0.06)
Box office gross	0.01	(0.04)	−0.01	(0.03)
Post-Paramount case	0.14	(0.15)	0.27*	(0.14)
Firm revenues	0.04†	(0.02)	0.03†	(0.02)
Firm experience	0.01	(0.10)	0.01	(0.01)
Talent pool	−0.01*	(0.00)	−0.01†	(0.00)
Executive tenure	−0.06*	(0.04)	−0.06***	(0.02)
Executive tenure squared	0.01**	(0.00)	0.01***	(0.00)
Producer experience	0.56***	(0.08)	0.68***	(0.09)
Budget	−0.23***	(0.04)	−0.12	(0.10)
Threshold parameter estimates				
θ_1	−3.48	(0.47)	−7.72	(0.78)
θ_2	−1.68	(0.44)	−6.85	(0.74)
θ_3	−0.13	(0.47)	−5.90	(0.73)
θ_4	1.38	(0.48)	−5.80	(0.70)
θ_5	3.29	(0.78)	−4.22	(0.71)
θ_6			−3.32	(0.72)
θ_7			−2.82	(0.71)
θ_8			−2.20	(0.72)
θ_9			−1.85	(0.71)
θ_{10}			−0.95	(0.72)
Log pseudo-likelihood	−5,511.88		−13,844.60	
AIC	1.717		4.304	

[a] $n = 6{,}446$. Robust standard errors corrected for the effects of clustered data are in parentheses.

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

DISCUSSION

Contributions to Theory

Our findings support the contention that status differentiation of team members and organizational hierarchies affect the exploration/exploitation trade-off in team composition. We see several contributions emerging from this study. First, we extend research on organizational search and the balance between exploration and exploitation. Whereas previous research has focused on organizational processes such as product innovation or market entry, we identify a new dimension, *team design,* in which organizational actors pursue their search for novel solutions vis-à-vis the execution of available alternatives. Moreover, teams represent a micro-organizational setting consistent with March's (1991) treatment of the trade-off between exploration and exploitation. However, whereas the original formulation of the theory focused on the different responses that newcomers and old-timers offer to organizations, we illustrate two antecedent mechanisms that limit the extent to which the two groups can be combined. Also, although previous studies on search processes (Fleming, 2001) have emphasized that there are no limits on the scope of potential recombination of components, our results instead indicate that restrictions do exist and not all combinations are possible.

The second contribution of this study is to the team literature. McGrath and colleagues (2000) encouraged studies on teams that would address relationships both at the team level and at the level of the boundaries between teams and their embedding systems. In this study, we analyzed team design as the outcome of both an informal process based on status differentiation at the team level, and a formal process based on different hierarchical structures at the organizational level. Moreover, although extant research has treated team composition as an exogenous variable (Williams & O'Reilly, 1998), we show that critical endogenous processes affect team composition. Reagans and coauthors (2004) challenged the use of demographic criteria in relation to the intrinsic limits placed on a manager's ability to shape the composition of a team. Our study suggests that a manager's degree of freedom in team composition can be constrained not only by fixed attributes linked to the demographic make-up of an organization, but also by variable attributes like organizational hierarchies and team member status. The U-shaped relationships found in this study show that such limits change endogenously, expanding or contracting managerial discretion.

Third, we extend the theory on social status by considering and measuring multiple evaluation processes by external audiences (Phillips & Zuckerman, 2001). To our knowledge, this is the first study that investigates status as a multidimensional construct. Previous research has focused on the interaction of single audiences with social actors, but we argue that different audiences simultaneously evalute individuals and organizations that operate in the same market and that although such evaluations are distinct, the social rankings they develop are interrelated. Our findings also indicate that middle-status conformity may be a very general mechanism that goes unnoticed when status is

TABLE 5
Robustness Tests[a]

Variables	Model 7: New Combinations Index, Triadic Combinations		Model 8: Newcomers Index, Additive Status		Model 9: New Combinations Index, Additive Status		Model 10: New Combinations Index, Triad Combinations and Additive Status	
Status	−0.27***	(0.04)	−0.93***	(0.21)	−0.81*	(0.34)	−0.67**	(0.23)
Status squared	0.01***	(0.00)	0.05**	(0.02)	0.06**	(0.02)	0.04*	(0.02)
Two hierarchical layers	−0.43***	(0.11)	−0.48***	(0.08)	−0.40***	(0.10)	−0.43***	(0.11)
Three hierarchical layers	0.19**	(0.07)	0.18**	(0.06)	0.15*	(0.06)	0.19**	(0.06)
Box office gross	−0.01	(0.03)	0.01	(0.04)	−0.01	(0.03)	−0.01	(0.03)
Post-Paramount case	0.20	(0.13)	0.14	(0.15)	0.29*	(0.13)	0.21	(0.13)
Firm revenues	0.04†	(0.02)	0.04†	(0.02)	0.03†	(0.02)	0.04†	(0.02)
Firm experience	0.01	(0.01)	0.01	(0.01)	0.01	(0.01)	0.01	(0.01)
Talent pool	−0.01	(0.00)	−0.01*	(0.00)	−0.01†	(0.00)	−0.01	(0.00)
Executive tenure	−0.04†	(0.02)	−0.06*	(0.04)	−0.06***	(0.02)	−0.04†	(0.02)
Executive tenure squared	0.01*	(0.00)	0.01**	(0.00)	0.01***	(0.00)	0.01**	(0.00)
Producer experience	0.65***	(0.09)	0.54***	(0.08)	0.69***	(0.09)	0.65***	(0.09)
Budget	−0.13	(0.11)	−0.22***	(0.05)	−0.12	(0.11)	−0.12	(0.11)
Threshold parameter estimates								
θ_1	−4.75	(0.48)	−2.04	(0.54)	−5.84	(0.79)	−6.12	(0.66)
θ_2	−2.64	(0.34)	−0.23	(0.51)	−4.98	(0.75)	−4.01	(0.51)
θ_3	−0.06	(0.33)	1.31	(0.48)	−4.03	(0.72)	−1.42	(0.44)
θ_4	1.40	(0.30)	2.82	(0.52)	−3.21	(0.67)	0.04	(0.40)
θ_5			4.73	(0.90)	−2.35	(0.68)		
θ_6					−1.46	(0.68)		
θ_7					−0.96	(0.67)		
θ_8					−0.34	(0.67)		
θ_9					0.01	(0.66)		
θ_{10}					0.92	(0.66)		
Log pseudo-likelihood	−7,856.48		−5,517.69		−13,858.46		−7,855.00	
AIC	2.443		1.718		4.307		2.442	

[a] n = 6,446. Robust standard errors corrected for the effects of clustered data are in parentheses.
† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

analyzed through the lens of a single audience. This insight suggests that future studies should account for the judgment of different audiences when assessing the impact of social status on individual or organizational outcomes.

Fourth, our study provides empirical ground for simulation studies that investigate how organizational structures moderate the balance between exploration and exploitation (Rivkin & Siggelkow, 2005; Siggelkow & Levinthal, 2003). Siggelkow and Levinthal (2003) compared structures in which each subunit made its own decisions to structures in which decisions were made only at the firm level. The first type of structure supports parallel search but suffers from lack of coordination. The second allows weighing interactions that local managers may ignore but suffers from low exploration. The authors' findings suggest ignoring interdependencies for an initial phase so that each team is given "free reign and exhorted to find the best solution for its own sub-problem" (Siggelkow & Levinthal, 2003: 665). The suggestion that wider freedom for low-level managers will increase exploration has also been expressed in the general management literature (Hamel, 2000). Our results point to a different and counterintuitive implication: when unleashed, project managers may face a riskier set of options. A higher degree of autonomy may increase managers' constraints and decrease their freedom to explore new solutions. In fact, a recently estimated simulation model has shown that restrictions on managerial freedom at lower levels might actually broaden exploration (Rivkin & Siggelkow, 2005). Our study provides theoretical justification and empirical evidence consistent with such a model.

Implications for Management Practice

Team composition requires choosing particular options from a set of possible choices, and managers need to minimize the risk of making the "wrong" choices in team configuration. Our findings have two implications for action. First, high status signals the potential value of team members, and it drives solutions to combine members at reduced risk. However, status may constrain choices of other members. By ignoring status differentiation between members, team designers may generate two harmful consequences, destroying resources that are valuable for both projects and organization and triggering power conflicts in the team design or execution process. As a consequence, managers need to collect more information about external audiences and the social rankings they develop; however, multiple sources and regular information update make monitoring status a challenging task. Thus, the trade-off between exploration and exploitation is accompanied by a trade-off between information cost and negotiation over power controversies.

Second, managers cannot simply insert teams into an existing organization without being prepared to alter its structure (Hackman, 2002). Exclusive reliance on unit or top managers dampens coordination or exploration. Middle managers offer several advantages because they are closer to day-to-day operations and frontline managers. They can develop novel solutions because their repertoires of action are more diverse than top managers', and they can incorporate connections, function as communicators, and synchronize the tempo of organizational change (Huy, 2001).

Limitations and Future Research

Despite the support for the hypotheses that emerged, the present study has several limitations, and these suggest directions for future research. First, we relied on a selective analysis of personnel to evaluate the determinants of explorative design. The inclusion of a broader range of resources involved in film production could provide a more comprehensive picture of the role played by social status and coordination. Also, our study did not investigate the effect of individual characteristics on explorative decisions. Future research could compare the impacts of status and hierarchy with those of established measures of team diversity such as age, gender, and ethnicity. Second, we limited our study to a set of large organizations within one industry. It would be important to extend our analysis to smaller producers, not only to avoid size bias, but also to determine the consistency of the patterns we observed. Third, although we were able to assess the mix of exploration and exploitation at the team level, we did not analyze team or firm performance. Future research could attempt to specify what team composition is best for superior performance and how performance induces feedback on team design and structural determinants of exploration and exploitation. Fourth, despite the controls we introduced, we did not directly account for the strength of past team combinations. In this context, it would be relevant to address the relationships between individual experience, experience of collaboration, and team composition.

Finally, we must caution against overgeneralization of the findings. We believe our arguments are valid for industries: (1) organized around sequential team production, (2) characterized by demand uncertainty, and (3) influenced by judgments and rankings formulated by multiple external audiences on outputs and inputs. Relaxing one or more of these conditions will require theoretical refinements and new empirical validation. Overall, these limitations provide intriguing puzzles for future work and for further exploration of this complex area of study.

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Fabrizio Perretti *(fabrizio.perretti@unibocconi.it)* is an assistant professor of management at the Institute of Strategic Management at Università Bocconi and at the Strategic and Entrepreneurial Management Department of SDA Bocconi School of Management. He received his Ph.D. in economics from the University and Polytechnic of Turin. His current research focuses on team composition, status organizing processes, and the role of organizational origins in industry evolution. Most of his research is focused on creative and media industries.

Giacomo Negro *(giacomo.negro@unibocconi.it)* is a postdoctoral researcher at the Strategic and Entrepreneurial Management Department of SDA Bocconi School of Management and the Institute of Strategic Management at Università Bocconi. He received his Ph.D. in management from the same university. His research interests include organizational and community ecology, social codes and organizational identity, and team composition, with an empirical focus on entertainment and leisure industries.